

Association for Information Systems AIS Electronic Library (AISeL)

ECIS 2006 Proceedings

European Conference on Information Systems
(ECIS)

2006

The dynamics of control and power and use of ICTs in contingent employment arrangements

Voutsina Katerina

London School of Economics and Political Science, k.voutsina@lse.ac.uk

Follow this and additional works at: <http://aisel.aisnet.org/ecis2006>

Recommended Citation

Katerina, Voutsina, "The dynamics of control and power and use of ICTs in contingent employment arrangements" (2006). *ECIS 2006 Proceedings*. 39.

<http://aisel.aisnet.org/ecis2006/39>

This material is brought to you by the European Conference on Information Systems (ECIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2006 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

THE DYNAMICS OF CONTROL AND POWER AND USE OF ICTs IN CONTINGENT EMPLOYMENT ARRANGEMENTS

Voutsina, Katerina, London School of Economics and Political Science, Houghton Street,
London WC2A 2AE, UK, K.Voutsina@lse.ac.uk

Abstract

The aim of this paper is to discuss the correlation between nature of work, employment pattern and technology used, by drawing upon the everyday working practice of Information Technology (IT) expert-contractors. By focusing on the way new technologies have provided the means for redefining the overall experience of the working life, this paper intends to shed light to the way individuals act upon the “material” to generate the Information Systems (IS) solution, as well as to the subsequent coordination patterns and power relationships emerging under non-standard employment arrangements.

Keywords: power, discretion, control, ICTs, coordination, contingent employment, IT highly skilled employees

1. INTRODUCTION

A universal concern of the business world and a dominant topic of discussion in most academic circles has been the dynamics of control and power emerging within the employment relationship (Zuboff, 1987; Barley and Kunda, 1992). Coercive, utilitarian, normative control practices (Etzioni, 1961), and relating managerial ideologies have been employed over the years in an attempt to secure the compliance between the employee's interests and those of the employer's (March and Simon, 1958).

According to the literature, whenever the nature of the work tasks imply some asymmetry of information between the employer and the employee -at the expense of the former-, minimizing the possibility of direct supervision and control (Eisenhardt, 1989), organizations should engage into indoctrination policies and into the provision of multiple perceived benefits. In order for the business organizations to ensure the devotion of knowledge-employees towards the organizational goals and objectives, they should provide a number of benefits, including health-care, pension, multiple monetary rewards and infrastructure for a secure career pathway, all related to life-time employment (Goldthorpe, 1998; Mintzberg, 1982; Newell et al. 2002). In other words, long-term hiring policies, secure work arrangements and enduring employment contracts seem to comprise the methods business organizations use to address the problem of not having sufficient means for supervising and managing knowledge workers.

However, current market experience challenges the aforementioned remark. Non-traditional employment arrangements and short-term work contracts seem to be on the rise even among consultants and professionals (Castells, 1996; Carnoy, 2000; Pierce, 1993), and particularly within the IS industry. Even though the traditional control mechanisms no longer apply to the asymmetrical-contingent relationship between the firm and the knowledgeable contractor and the possibility of opportunism exertion on the part of the latter is a non-negligible prospect, more and more organizations tend to shift towards the contingent type of employment pattern for covering highly specialized Information Systems (IS) needs.

In order to gain a substantial understanding of the emergence of new employment forms and their subsequent control mechanisms, it is important to investigate the very way work is articulated and mediated by technology (Castells, 1998; Kallinikos, 2001; Sorensen and Wiredu, 2005). It could be argued that far-reaching innovations in the organization of work seem to be usually accompanied by fundamental changes in technology as well as the way people perceive and interpret work (Barley, 1996). In literature, there have been numerous empirical studies and theoretical analyses about how Information and Communication Technologies (ICTs) have altered the way work is performed and have accommodated new employment forms and work patterns (Nardi et al. 2002; Karahira et al, 2002; Schmidt and Simone, 1996). Yet, the issue of control and coordination of dispersed and highly independent knowledge-workers seems to remain still elusive and open to discussion and elaboration. It seems to be under the surfaces of new organizational forms that technologies of control and coordination mechanisms lay. Castells (2003) talks about self-programmable labour that doesn't actually need to be supervised, since it is by definition committed to the project under completion and Maravelias (2003) refers to much more subtle, but no less disciplinary control strategies that set as "their targets not individual's direct behaviour, but their thoughts, emotions and identities".

This paper aims at investigating further how the concept of power and control between the client-organization and the highly specialized Information Technology (IT) contractor is renegotiated in the premises of contingent employment forms; focusing on the nature of the IS work, the emergent patterns of communication and the ICT enabled modes of interaction, the article alleges to provide an illuminating perspective of the conjuncture tissues that allow this type of work arrangement to burgeon..

The investigation is based on the preliminary analysis of qualitative data gathered from fifteen interviews with IT expert contractors and managers engaged in contingent forms of employment. Respondents were asked about the way they perform and coordinate their everyday tasks, about the

tools they use and about the way they conceptualize the dynamics of control developing within their work relationship. The analysis of empirical data suggests that technologies of information and communication have significantly facilitated the communication and connectedness of individuals across and within contexts and boundaries, paving thus the way for the flexibilization of work practices and employment patterns. Substituting the need for direct supervision, control and side-to-side cooperation, ICTs have generated fertile conditions for effective work performance and fair collaboration among independent agents.

The empirical findings have been described and analyzed through the theoretical lenses of an organizational model that identifies the structural-elementary components of the work task and the accruing work roles developed within a work arrangement. Applying the concepts of the model in the case of the IS work in general and in the case of contingent IS work in particular, the paper attempts to address in a straightforward fashion the way ICTs have redefined work practices, control and equilibrium mechanisms under non-conventional employment arrangements.

The remainder of the paper is structured as follows. Next section outlines a theoretical model that correlates work features, control mechanisms and power relations. Sections 3 and 4 present the main constructs of interest of the empirical study. Sections 5 and 6 present the results of the preliminary empirical research and analyze them according to the theoretical directions of the model presented in section 2. And finally, section 7 discusses the general findings and concludes the paper. In short, as the article proceeds, it aims to unfold and describe the special contingencies met in the IS outsourcing and the intervening (enabling and balancing) role of technology in the formulation of this contingent employment relationship.

2. PERROW'S MODEL

In an attempt to describe the special contingencies met by the IS work, I will draw upon an organizational framework proposed by Perrow (1967). The model focuses on the way an individual acts upon an object, in order to make some change upon that object (this is what Perrow calls "technology), as well as the subsequent relationships or arrangements that emerge between people who contribute to or intervene in the transformation process. Drawing upon the notions of "analyzability", "understandability" and "variability" of the problem under resolution, Perrow (1967) aims to shed light to coordination and control issues and reach some insight about appropriate task structures and interaction patterns. His analysis has been particularly appealing, as it links in a subtle and simultaneously straightforward fashion work features with control issues and power relations.

Before getting into further details about the concepts developed in the model, let's briefly describe its core theoretical constructs:

Analyzability of the problem refers to the number of exceptional cases encountered in the course of work and the nature of the search process undertaken by the individual, when exception occurs (Simon and March, 1958).

Understandability refers to the degree an individual is able to control the problem dimensions and achieve predictability and efficiency in their handling. The more uniform and stable the "raw material" is, the more understandable the problem under solution is and the greater the chances for secure success are.

Control is described by the degree of discretion an individual possesses in carrying out its tasks and the power it has to mobilize scarce resources and give definition to various situations.

Coordination refers to the pre-programmed interaction of tasks (March and Simon, 1958; Mintzberg, 1983), as well as to the adjusted and emergent organization and management of tasks, according to the gained feedback.

Combining the above theoretical constructs in a four-fold matrix, and assuming that interaction between technicians and their supervisors is necessary in order the production process to take place, Perrow (1967) infers to different alternatives of work structures and relevant degrees of interdependence.

	Discretion	Power	Interdependence		Discretion	Power	Interdependence
Technical Superv.	Low	Low	Low (1)	High	High	High (2)	
	High	High		High	High		
Technical Superv.	Low	High	Low (4)	High	High	Low (3)	
	Low	Low		Low	Low		

Figure 1: Perrow (1967) Task-Structure and Task-Related Interactions

In situation where individuals encounter non-uniform raw material which is poorly understood, exceptional cases appear quite often and the search process cannot be done in an analytical way, exertion of high degree of discretion is expected by both parties of the organization. The power of both parties will be high, coordination will be attained through constant feedback and mutual adjustments and consequently the interdependence of the aforementioned will be high (cell 2).

Low interdependence is observed when the material under transformation is stable and uniform (thus easily understandable) and the few exceptions encountered are effortlessly analyzable. Exertion of discretion is unlikely to be observed and the power of technicians is reinforced since the latter guide the activities of supervisors “on the basis of routine reports” (cell 4) (Perrow, 1967). Cell 1 and cell 3 represent some variations from either the two aforementioned extremes and can be analyzed accordingly.

3. INVESTIGATING INTO IT EXPERT CONTRACTORS’ REALITY

“IT experts” or IT specialists are considered to be those software engineers, programmers and consultants who are responsible for the development, maintenance and improvement of new technologies, and the generation of IS solutions. What is striking about this category of IT employees is that they are considered to be particularly knowledgeable, gifted at their craft. Their formalized abstract knowledge, as well as their acquired experience offers them significant “antecedence” in comparison to the rest IT workers.

Taking into account Perrow’s (1967) analytical model and bearing into mind the asymmetry of information inherent in the relationship between the highly specialized IT employee and the hiring firm, I will endeavour to examine some practical issues related to the sustainability of contingent forms of employment (the term refers to those employment arrangements that are characterized by a limited duration and are sealed by a short-term contract) in the IS industry. Focusing upon the way new technologies have redefined or at least have provided the means for redefining the overall experience of the working life (Beck, 1992; Kallinikos 2001, 2003), I intend to shed light to the way individuals act upon the “material” and generate the IS solution, as well as to the subsequent coordination patterns and power relationships emerging under non-standard employment arrangements.

Initially, it will be presented how a highly specialized IT worker performs his/her work and interacts with his/her colleagues, independently of the form of employment, standard or non-standard, the latter is engaged to. A thorough presentation of the structural characteristics of IT expert work seems to be necessary for an adequate understanding of the way this kind of work is correlated with and applicable to contingent settings. In a second phase, further attention will be drawn to the practicalities of contingent work reality and the mediating and balancing role of new technologies. Indicatively it could be mentioned that contingent IT experts or IT contractors are not tied to the organization through the traditional, salaried kind of employment relationship; they sell their services to firms

(client-firms) in a project-by-project basis and have always to move on to new prospective firms, just after each project is completed.

The subsequent presentation and analysis has been based upon the preliminary data gathered by some interviews with IT expert contractors and their hiring managers. Respondents were firstly asked to describe how they generally perceive the nature of the IS expert work and the developing relations of control and interdependence between them and their supervisors/subordinates. Secondly, they were asked to comment and provide details about how the above practices and work roles are enacted under contingent forms of employment.

4. EMPIRICAL STUDY

The group of informants consisted partly of IT experts who work as independent contractors and partly of project managers (permanent employees of the client firm) who hire and supervise these contractors. Out of the fifteen interviewees, four of them were general IT consultants-managers, two of them were deeply specialized on a very particular technology or package (such as SAP), six were specialized in a wider range of technologies, and three were managers of the client-firm.

Taken as granted that there was not a representative enumeration of IT individuals who work as freelancers, the potential selection of informants posed several limitations and introduced several layers of bias. Bearing into mind the above, I chose to select informants from the Federation of Greek IS enterprises and IS personnel list, following the logic of a snowball sampling. Client-firm managers were also selected from the same pool of data. The aforementioned Federation has been selected as the source of extraction of empirical data, since it is considered to be a significant pole of attraction for both IT contractors and their impeding client-firms and furthermore the only IS association well reputed and easily identifiable in Greece.

Attention should be drawn to the fact that although the above respondents cannot actually be conceived as representative of the IT contracting population in Greece -in the strict statistical sense-, the investigation into their personal career history and experience can be of great research value in relation to the overall understanding of the relationship between nature of work, employment patterns and technology. In particular, the present research has been designated to enrich our understanding about the role of technology regarding the emergence and sustainability of contingent employment forms in the IS sector, and not to assess the generalization of its findings to the greek population of IT contractors.

Semi-structured interviews ("ethnographic interviews", Barley et al, 2002) have been conducted and structured around a common set of open-ended questions that aimed to explore the contingencies of the IS occupation and the enabling role of ICTs that renders the IS work amenable to freelancing. Drawing upon the everyday practice, IT respondents were invited to describe how they experience and perceive their work organization and employment relation texture in the light of the ICTs mediation. An approximate interview guide revolving around Perrow's (1967) model theoretical constructs and designed to structure the emerging conversations with the interviewees can be found in the appendix.

All the interviews were tape-recorded in participants' work places in Athens and most of them lasted from one hour to one hour and a half. Furthermore, some informants have been interviewed twice, whenever the initial transcription of their sayings rendered necessary a second round of interview in order for certain issues to be further clarified and explained.

5. PERCEIVED NATURE OF THE IS EXPERT WORK- PERCEIVED INTERDEPENDENT RELATIONS AND CONTROL MECHANISMS

The peculiarities accompanying the nature of IT work could be better described and analyzed in terms of the conditions that appear in the cell 3 (Perrow, 1967).

Applying Perrow's theoretical constructs in the way an expert IT employee performs a given task in everyday practice, one could come to the following remarks: It could be argued that IT expert work is considered to be significantly complex and unpredictable, since the involved individual often encounters theoretical and technical puzzles which he/she is not completely familiarized with. Although he/she is particularly specialized on a particular technology or an IS field, the need for generating cut-and-tailored solutions, according to the specific idiosyncrasies of the client-firm can imply unpredictable problems and difficulties.

He /she has to organize previously held knowledge, accumulated experience and instant inspiration, in order to meet project's special requirements and firm's time and budget's constraints. There are no pre-defined courses of actions and well specified technical methods that can guarantee the success to any problem. IT expert has to experiment and try out different things, activating improvisation and innovation mechanisms that will allow a flexible and timely encounter with the arising software solution peculiarities.

"Trial-and-error practices, creative combination, constant "bricolage" of the existing components of knowledge and experiences as well as continuous interaction and sharing of experiences with peers of the same occupational community could be considered as "fixed" tactical behaviors that we usually engage into, in order to overcome everyday problems and difficulties."

The nature of the search process that the individual adopt in order to find a layer of light within the darkness of data streams and complicated algorithms could be characterized to be "though non-routine..., logical, systematic and analytical" (Perrow, 1967). Although the individual is entitled to perform "exceptional actions", he/she follows a sequence of steps that can be described and presented in a logical, analytical basis. His/her search undertaken is not conceptualized in terms of intuition, chance and guess-work (Perrow, 1967), but in terms of a mathematical logic that can be analyzed, challenged, questioned and improved. The aforementioned analytic techniques can be documented/depicted in symbols and signs, consisting almost part of an existing reality.

As far as the understandability and the variability-uniformity of the nature of the raw material is concerned, it could be argued that increased knowledge and deep understanding of a coding language, a database management system, or a specific operation system often entails significant control and manipulation over it. Theoretically, the more the IT person is conscious of the potentials and limitations related to the software application he/she is working with, the more he/she can predict its "behavior" and manipulate the emergence of exceptional cases.

Yet, in practice increased knowledge about a software application does not always guarantee efficiency in the handling of the software material. This is particularly true in the case of software industry where the existence of black boxes and the development of obscure interactions between the different parts/modules of the software is a common regularity. Commenting on the consisting parts of a software entity, Brooks (1996) notes: "the elements interact with each other in some non-linear fashion and the complexity of the whole increases much more than linearly". Such an increased complexity and conceptual confusion are considered as inherent properties of the essence of modern software systems that no IT specialist can really escape or avoid. The more an IT expert is connoisseur of a software artifact, the more conscious he/she is of the unavoidable obscurity, variability and insignificance that accompany diverse practical aspects of the specific software and make his/her choices even more difficult and doubtful.

Consequently, the degree of discretion an IT expert possesses in carrying out the task assigned and the power he/she has to control the definition of the IT solution produced (Perrow, 1967) are expected to be high, since the existence/ handling of many unexpected exceptions and the generalized complexity and abstractness encountered necessitate the mobilization of scarce knowledge resources that only few people would be able to activate. Judgments about the logic of "transformation process" conducted, the sequence of tasks requested, possible sub-tasks identification, potential interaction and interdependencies of tasks involved, are bound to the IT expert area of responsibility, diminishing the

manager's capability to have a clear and accurate view about what kind of work is done, how it is done and how it should be done.

To put it differently, in the course of IS designing and programming, the IT expert devises innovative-customized solutions, non-existent before and opens conceptual paths that are not always easy to be followed up, even by people of the same specialization. An indication of the latter would be the fact that many subtasks of IS projects undertaken by just one individual have their own logic and history of development, rendering particular difficult for another IT worker to take over a partially completed task from another one (Barley and Kunda, 2004). The above observation regarding the easiness of following-up and substantial understanding of IT work is even more truthful in the case of firm's managers who are completely ignorant about internal details and practicalities that this kind of work presupposes and entails.

As far as coordination among different tasks is concerned, it could be sustained that according to the complexity and the size of the project, the IT employee can undertake a whole project by himself/herself or he/she can be in charge of a small part of a project. In software development "the knowledge develops as the work unfolds" (Mintzberg, 1983) and no one knows a priori what exactly needs to be done. Consequentially mutual adjustment and negotiated alterations in the nature or sequence of tasks conducted are a common coordinating mechanism among IT specialists who jointly contribute to the generation of the IT solution. Contrariwise, the interaction between IT personnel and its supervisors is much more predicted and programmed and largely defined by rules. Managers and supervisors do not really intervene in the transformation process of the raw material. Lack of relevant knowledge constrains them to just assess the derived output according some predefined criteria or standards. Interdependence between them and the IT specialists seem to be rather low and insignificant.

6. WORK IN PRACTICE, CONTROL AND POWER RELATIONSHIPS IN CONTINGENT FORMS OF EMPLOYMENT

6.1 Handling of exceptional cases-performance achieved upon the material

All informants interviewed linked the emergence of freelancing and consulting in the IS sector with the urgent need for state-of-the-art services and the enabling facilities provided by ICTs.

An organization usually contracts an IT expert to accomplish a highly demanding technical task that the in-house "expert human capital" is not in position to undertake and the competitive pressure of the market does not leave leeway for internal development and production. "The company has always used contractors to absorb industry fluctuations or to work in highly specialized areas..." (Pierce, 1993). As a result the contractor is hired by the client-firm to perform rapidly and efficiently the task assigned. As stated before, no matter how specialized and experienced a contractor may be, he/she doesn't always know a priori the exact stream of actions he/she is expected to do. Contextual peculiarities of the client-firm and the need for cut-and-tailored solutions conduce to the emergence of non-familiar stimuli and exceptional cases difficult to manipulate and handle.

In a conventional employment relationship, knowledge workers and professionals increase the depth of their knowledge and reinforce their ability to cope with technical peculiarities and difficulties, by interacting and socializing with peers with whom they are working side by side (Abbott, 1987). Understandability of the problems encountered and perceived variability of the software solution is enhanced through the exchange of opinions among co-employees who share the same organizational norms and objectives.

In contracting, the IT expert is frequently considered to be the outsider who is paid double rate from the permanent employees in order to bring into the firm valuable components of knowledge and experience.

“Contingent inability of the contractor to handle efficiently the exceptional cases and emergent problems is highly unexpected and strictly “prohibitive” and should never be observed by the permanent personnel of the client-firm which bides its time to undermine contractor’s reputation.”

In that respect the IT freelancer has to perform effectively and silently the task assigned, avoiding to expose himself/herself to the firm’s employees. Yet, taken as granted that professional-expert knowledge is considerably dependent upon the on-going interaction with senior partners and peers of the same occupational community ((Kallinikos and Hasselbladh, 2003), there is no other option for the IT contractor than to re-establish communication channels with relevant ex-peers and friends, through the use of electronic tools and devices, beyond the limits of the client-organization.

It is the technologies of information and communication that have considerably facilitated the communication and connectedness of individuals across and within contexts and boundaries (Castells, 1998)), and thus paved the way for the development of virtual human networks. The creation and maintenance of such networks, enabled mainly by Internet-based and mobile technologies, operate like a buffer against professional isolation and knowledge impoverishment of the specialized contractor. Alternatively, these technology-supported networks constitute a direct substitute of the traditional office environment.

In practice, whenever an exceptional problem arises, a problem that the IT freelancer is not really familiarized with, he/she can instantly contact a friend or search within the world wide web to find possible proposed solutions or explanations. “On-line bulletins boards, on-line chat-rooms, web-reference material” (Barley et al., 2002), on-line forums and specialized Internet sites provide detailed and accurate information about various software programmes and state-of-the-art technologies and tools.

“By pressing a button or by typing a relevant question in a on-line bulletin board, one can get instantly the technical solution he/she is looking for, saving enormous amount of time and energy that otherwise it would have been unfairly spent. It is a common fact that an exceptional problem for a freelancer X, may be a trivial one for freelancer Y, and vice versa.”

Sharing of knowledge among dispersed individuals entails increase of general knowledge the IT expert possesses and better understandability of the nature of the software entity that the latter wants to transform. And intense interaction between individuals facing relevant problems and difficulties allows more analytic techniques to be used, more experience to be gained and less stimuli to be seen as intricate exceptions (Perrow, 1967).

To conclude the present session, I seize the opportunity to draw the attention on the assumption that all the above argumentation relies upon: Search process, puzzles solving and knowledge updating are carried out in such a logical and analytical mode, as to permit their oral or written documentation and concomitantly their transferability and applicability across contexts (Kallinikos, 2001). In a different case, where the search process is based on unanalyzed experience and intuition, virtual interaction supported by new technologies could possibly be a less fruitful and effective substitute of knowledge sharing.

6.2 Power and control distribution

Apart from the issue of effective performance and manipulation over the raw material, contingent work arrangements renegotiate the definitions of control and power developed within the employee-employer relation. As already mentioned in previous section, the nature of software developing is such that the IT employee possesses a considerable degree of discretion and power in the transformation process of the raw material, usually at the expense of the supervisory group. To put it in other words, the employer engages an employee to act in his (the employer’s) interest, in circumstances in which the employer cannot observe the employee’s actions, nor share in all of the information guiding those actions (Goldthorpe, 1998).

In particular, under short-term employment arrangements, the aforementioned observation is rendered much more acute, since the hired contractor usually performs the work remotely and direct supervision is rather impossible. IT specialists are employed to accomplish a technically demanding task for a short period of time and their contact with the organization is limited to few meetings with the manager or the technical supervisor of the project. Sometimes, there is only one initial meeting with the above individuals and the rest of communication is taking place on-line.

Relevant literature suggests that whenever the nature and location of work preclude the formalization of behavior and the use of direct supervision, organization has to rely upon indoctrination tactics, normative control strategies, etc. (Goldthorpe, 1998; Mintzberg, 1983). And yet, everyday practice challenges the above remarks, bringing to the fore the popularization of out-sourcing and consulting in professional labour markets. (Castells 2000; Matusik and Hill 1998; Laubacher and Malone 1997; Tilly and Tilly, 1998). Taking into account the simultaneous emergence of new employment forms and the expansion of new technologies in current work place, it would be plausible to look into the regulative and balancing role played by these technologies, in order to understand the re-establishment of power and control equilibrium between the two parties involved.

Despite the fact that the hired expert employee exerts a great deal of discretion and power in the way work task is defined and carried out, there seem to be a number of formal and informal conventions and practices supported by the new possibilities provided by ICTs, that set limit to the potentially arbitrary behaviour of contractor and empower the position of the client-firm in the market. Commenting on the above, the interviewed contractors and managers reported the following:

□ ICTs and documentation

Technological artifacts themselves operate as monitoring and control mechanisms, since they automatically record and track information that describes the process of development and testing of the deliverable. In other words, IT expert's allocated effort being represented in a digital format, can be logically analyzed and thus relatively assessed according to some functionality and professional standards.

□ ICTs and transparency in the market conditions (supply and demand)

Internet technology allows easy and quick access to multiple source of information in relation to the special market conditions. A quick search in specialized web sites can provide significant details about ready-made, off-the-shelf software packages, (functionality, general specifications, facilities provided, market price), allowing the client-firm to formulate a general opinion about the price that it should pay for a particular product or service.

□ ICTs and easiness of accessibility to the employee target

Furthermore, new technologies of information and communication seem to contribute considerably to the reduction of transaction costs (costs of carrying out any kind of exchange and are associated with bargaining, information search, contracting, monitoring performance, etc.) emerging in business arrangements. Internet technologies reduce the costs of finding, selecting, working with, and paying people for a project, generating fertile conditions for the proliferation of free-lancing and outsourcing employment forms (Malone, 2004).

If it is assumed that a significant step in order "to carry out a market transaction, it is to discover who it is that one wishes to deal with..." (Coase, 1937), then the possibilities provided by the ICTs for the client-firm to reach the desired target audience are immense in comparison to the possibilities held in the past. Contacting staffing agencies specialized in matching candidate skills with job requirements, client-firms have easy and cost-effective access to a wide range of possible applicants all over the world. Interviewed contractors and hiring managers reported that 70%-80% of the search process for the appropriate candidate or for the proper job (independently if the search is accomplished through staffing agencies or informal networks of friends and ex-colleagues) is taking place in a virtual mode.

Conclusively, supporting exchangeability and mobility of the expert labour force, ICTs have empowered the employer at the expense of the contingent employee, who no matter how expert he/she is, is not anymore irreplaceable. Power and control seem to be balanced between the contractor who possesses the expertise needed for the application completion and the client-firm who is aware of the market forces and initiates the decision for the establishment of the employment relationship.

6.3 Coordination of dispersed agents

Unless the technology used or the security level of the project inhibits the distant accomplishment of the work assigned, most of the contractors interviewed choose to work distantly and synchronize their work to the work of others through the use of communication and collaboration apparatus.

Contracted IT expert work seem to be independent or interdependent according to the complexity of the software application that needs to be done as well as the size of the client-organization (number of hierarchical levels and number of departments). Yet, even if the level of interdependency is low, collaboration and constant communication between the contractor and the client firm is more than just necessary, in order to be assured that the software application delivered proceeds according to the desired (required) development processes (documented requirements and specifications, documented design and architecture, testing and test reports). In general, in the IS engineering, where the work tasks cannot be fully programmed in advance, surprises and unexpected events emerge all the time, making necessary for individuals to make informed distributed decisions (Schmidt and Simone, 1996). IT contractor and the project manager or IT manager of the client-firm have to contact each other multiple times, beyond the officially arranged meetings and pre-set milestones.

It could be argued that new technologies, enabling and facilitating new modes of communication and collaboration at a distance, within and across organizational boundaries (Kallinikos, 2001; 2003), have contributed significantly to the expansion and sustainability of non-conventional forms of employment. E-mail technology, phone and video conferencing systems, specialized software for sharing information, i.e. presentations, and data, across different computer systems (Microsoft's Netmeeting) constitute technologies that support relatively flexible conversations at a reasonably low cost. Among them, electronic e-mail seem to be the most popular groupware application, that seem to always mediate interactions between IT contractors and client-firms in any stage of their collaboration.

7. DISCUSSION-CONCLUSION

The aim of this paper has been to discuss upon the correlation of nature of work, employment patterns and technology used, by drawing upon everyday working practice of highly specialized IT contractors. Consistent to Perrow's theoretical model, the position taken here is that to call for a particular employment arrangement is rather to call for a type of task structure and embedded relations that can be realized with a certain technology. The way work is carried out, in terms of the transformation process of the raw "material" and in terms of the interactions developed among the individuals involved, defines accordingly the employment patterns and work arrangements.

In general, the way IT specialized employees perform their work (handling of problems and exceptional cases encountered, perceived understanding of the nature of the raw material, perceived uniformity, variability and stability of the raw material) is closely linked to the power relations that emerge between them and their supervisors. Power relations in their turn define control practices and task interdependency between the parties involved.

In contingent forms of employment, where the dimensions of time and space have become more blurring and insignificant, work conditions are altered, challenging the balanced relations met in traditional forms of employment. In order a new equilibrium to be achieved, new practices and tools have to be accordingly employed: and here is exactly where the enabling role of ICTs lays.

Preliminary interview findings confirm that contractors could not carry the burden of professional isolation and personal knowledge updating without the possibilities of communication and connectivity provided by ICTs. On the other hand, given the fact that expert knowledge is not easily amenable to classical supervising techniques and that lack of physical proximity makes control even harder to be applied, it would be reasonable to assume that the “buying in” of professional services should be strongly avoided; and yet market transparency and information diffusion enabled and promoted by new technologies, empower the position of the client-firm, balancing that way the relationship between the later and the contingent expert employee.

In conclusion, it could be argued that although the potential of technology to support new organizational structures has recurrently appeared in literature, detailed investigation of the way special features of work nature invite or exclude specific technologies (which in their turn pave the way for certain employment arrangements) is a research topic that needs to be further elaborated and explored. “Bringing work back” (Barley and Kunda, 2001) and correlating it with the technological context of use can provide a significant insight in our understanding of current workplace.

REFERENCES

- Abbott A. (1987), *The System of Professions: An Essay on the Division of Expert Labor*, The University of Chicago Press, Chicago and London
- Beck U., (1992), *Risk Society: Towards a New Modernity*, Sage: Thousand Oaks, CA
- Barley, S.R. (1996), “Technicians in the Workplace: Ethnographic Evidence for Bringing Work into the Organization Studies”, *Administrative Science Quarterly*, 41, (3), 404-441
- Barley S.R. and Kunda G. (1992), “Design and Devotion: Surges of Rational and normative ideologies of control in Managerial Discourse”, *Administrative Science Quarterly*, 37, 363-369
- Barley S. R., and Kunda G., (2001), “Bringing Work back”, *Organization Science*, 12, (1), 76-95
- Barley S.R., Kunda G. and Evans J., (2002) “Why do contractors contract? The experience of highly skilled technical professionals in a contingent labor market”, *Industrial Relations*, 55, (2), 234-261
- Barley S. and Kunda G. (2004), *Gurus, hired guns and warm bodies*, Princeton University Press
- Carnoy M. (2000), *Sustaining Flexibility: Work, Family and Community in the Information Age*, Cambridge, MA: Harvard University Press
- Castells M., (1996), *The rise of the network society*, Oxford: Blackwell
- Castells. M., (2003), *The Internet Galaxy: Reflections on the Internet, Business and Society*, oxford University Press
- Coase R.H., (1937), “The Nature of the Firm”, *Economica*, 4, 386-405
- Eisenhardt M.K., (1985), Control: Organizational and economic approaches, *Management Science*, 31, (2), 134-150
- Goldthorpe H.J., (1998), *On Sociology: Numbers, Narratives and the Integration of Research and History*, Oxford: Oxford University Press
- Kallinikos J., (2001), *The Age of Flexibility, Managing Organizations and Technology*, Academia Adacta AB
- Kallinikos J., (2003), Work Human Agency and Organizational Forms: An Anatomy of Fragmentation, *Organization Studies*, 24, (4), 595-618
- Kallinikos J. and Hasselbladh H., (2003), “Employment Regimes and Organizational Forms: Organizational Change at the Close of Modernity”, 19th EGOS Colloquium, Organizational Analysis and Form in Social and Global Development, 3/5, July 2003, Copenhagen Business Schools, Copenhagen Denmark
- Kakihara M., Sorensen C. and Wiberg M., (2002), Fluid mobile work, In 1st Global Mobile Roundtable, Tokyo, Japan, ed. Takeishi. Institute of Innovation Research, Hitotsubashi University
- Mallone W. T. and Laubacher R. J. (1998), The dawn of the e-lance economy, *Harvard Business Review*, September-October 1998
- Maravelias C., (2003), Post-bureaucracy- control through professional freedom, *Journal of Organizational Change Management*, 16, (5), 547-566

- March J. and Simon H. (1958), *Organizations*, New York: Wiley
- Matusik S.F. and Hill C.W.L. (1998), The utilization of contingent work, knowledge creation and competitive advantage, *Academy of Management Review*, 23, (4): 680-697
- Mintzberg H. (1983), *Structure in Fives: Designing effective Organizations*, Prentice Hall, Inc., Englewood Cliffs, New Jersey
- Nardi B. A., Whittaker S. and Schwarz H. (2002), "NetWORKers and their Activity in Intentional networks", *Computer Supported Cooperative Work: An International Journal*, 11, 205-242
- Newell S., Robertson M., Scarbrough H. and Swan J., (2002), *Managing Knowledge Work*, Palgrave, NY
- Perrow C., (1967), A framework for the comparative analysis of organizations, *American Sociological Review*, 32, (2), 194-208
- Pierce L.J., (1993), "Toward an organizational behavior of contract laborers: their psychological involvement and effects on co-workers", *Academy of Management Review*, 36, (5), 1082-1096
- Schmidt K. and Simone C., (1996), "Coordination mechanisms: An approach to CSCW systems design", *Computers Supported- Cooperative Work: An International Journal*, 5, (2-3), 155-200
- Sorensen C. and Wiredu G., (2005), "The dynamics of control and use of mobile technology in distributed activities", accepted for publication in *European Journal of Information Systems*, 14, (4), December 2005
- Tilly C. and Tilly C., (1998), *Work under capitalism*, Oxford: Westview Press
- Zuboff S., (1987), *In the age of the smart machine: The future of work and power*, New York: Basic Books

APPENDIX: INTERVIEW GUIDE

Questions asked in the semi-structured interviews were of the following type:

- ☐ How the nature of the IS expert work is perceived? How the type and the quality of the relationship between a highly specialized IT worker and his/her supervisor is perceived?
- ☐ How the above relationship and accompanying work practices are conveyed in non-conventional employment settings? And in particular,
 - How do IT experts accomplish effectively the handling of exceptional cases encountered in every day life, being an "outsider" within a client-firm? How their ability to act upon the software material has been altered under the conditions of contingent work arrangements?
 - What are the control and coordination mechanisms that are taking place under non-conventional forms of employment and how are they sustained and enacted in practice?
 - What is the role played by new technologies of information and communication in relation to the emergence and the support of the above mode of work?